Significant Incident Report No. 259

Subject: Electrician injured by arc flash in low voltage switchboard

Date: 06 April 2018

Summary of incident

Note: The Department of Mines, Industry Regulation and Safety's investigation is ongoing. The information contained in this significant incident report is based on materials received, knowledge and understanding at the time of writing.

In February 2018, an electrician went to install a new power supply in a wall-mounted, low voltage (415 V) switchboard to provide three-phase power for an electric motor. He removed the escutcheon panel from the front of the switchboard (which was still live) and, as he tried to remove an existing circuit breaker with a screwdriver, there was an arc flash.

The electrician received thermal burns to his face, upper body and hands. His assistant also received burn injuries and both workers were temporarily blinded. Both the electrician and his assistant required hospital treatment for their injuries.

Arc flash damage to the low voltage switchboard showing the isolator in the “On” position (A) and the circuit breaker that was to be removed (B).

Direct causes

- There was a short circuit while working on the live switchboard.

Contributory causes

- Electrical work was undertaken while the switchboard was live.
- An inadequate risk assessment was conducted before carrying out the live electrical work.
- There were inadequate fault protection devices upstream of the switchboard.
- Inadequate personal protective equipment (PPE) was worn.

Actions required

When working on or near energised electrical equipment, the following actions are recommended to reduce the potential for electric shock and arc flash incidents:

- Before working on or near electrical installations, determine whether there is a requirement to work on the installation while energised.
- If a situation meets the conditions to work on or near energised electrical equipment or circuits, duty holders are to:
  - undertake a written risk assessment, performed by a competent person
  - develop a written safe work method statement
  - confirm suitable safety equipment and PPE are selected and used.

These actions reflect the requirements of the latest codes of practice (below) and the obligations under regulation 55 of the Electricity (Licensing) Regulations 1991 (ELR), which will come into effect on 14 May 2018.

Note: A risk assessment should include considering existing fault protection upstream of the electrical installation to be worked on.

- If required to de-energise the electrical installation, develop an appropriate procedure for de-energising the electrical equipment or circuits to be worked on.

Further information

- Standards Australia, www.standards.org.au

  AS/NZS 3000 *Electrical installations* (Australian/New Zealand Wiring Rules)

- Department of Mines, Industry Regulation and Safety

  Energy*Safety*, www.commerce.wa.gov.au/publications

  Persons working on or near energised electrical installations – code of practice

  Safe low voltage work practices by electricians – code of practice

  Mining safety publications, www.dmp.wa.gov.au/Safety/Safety-335.aspx

  Mines Safety Bulletin No. 138 *Electrical arc flash hazards in mining*

This Significant Incident Report was approved for release by the State Mining Engineer on 06 April 2018